

# Rhodora

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## SOME NEW GREEN ALGAE.

F. S. COLLINS.

(Plate 76.)

THE species here noted are only in part from New England localities, but so general is the distribution of plants of this class, that the mere accident of locality of the original station is of little importance; any species of the genera in question is liable to be found in any temperate region.

**Pleurococcus marinus** n. sp. Cellulis sphaericis, 10–40  $\mu$  diam. cum membrana cellulari; membrana 2  $\mu$  crassa; colore variante ab auriantiacono intenso ad viridem chlorophyllaceam veram; Reproductione per aplanosporas divisione repitita formatas, 8–64 in cellula; membrana cellulari distincta et admodum crassa dum in cellula matricali; congerie sporarum substantia gelatinosa inclusa, post solutionem cellulae matricalis formam sphaericam diu servante.

Cells spherical, 10–40  $\mu$  diam., including cell wall; wall about 2  $\mu$  thick; color from deep orange to true chlorophyll green. Reproduction by aplanospores, formed by repeated division, 8–64 in a cell, spore wall distinct and relatively thick while still in the mother cell; mass of spores retaining the spherical form and held in a gelatinous mass long after the disappearance of the mother cell wall.

This plant was distributed through a mass of floating algae in shallow pools in a salt marsh at Stover's Point, Harpswell, Maine, July, 1906. It formed so large a proportion of the mass as to give a brick- or orange-red color to the whole, the other species being *Lyngbya aestuarii* (Mert.) Liebm., *Cladophora expansa* Kütz., and other forms usually found in such localities. It has been distributed as No. 1316 of the Phycotheca Boreali-Americana. The genus *Palmellococcus* was founded by Chodat in 1894,<sup>1</sup> for the single species

<sup>1</sup> Chodat, Matériaux pour servir à l'histoire des Protococcoïdées. Bull. Herb. Boissier, Vol. II, p. 429, 599.

*P. miniatus* (*Protococcus miniatus* Kütz., *Pleurococcus miniatus* Näg.), which is not uncommon on walls and windows of greenhouses, but whose native habitat is unknown; Chodat reports its reproduction under ordinary circumstances to be by bipartition, rarely quadripartition of the cell; but in culture in pure spring water the contents of a cell is by repeated division sometimes transformed into 16, 32 or 64 spores with delicate membrane, escaping in a mass with a gelatinous envelop. This latter form of reproduction is the only one observed in *P. marinus*, but practically all of the Harpswell material seemed to be in some stage of this process. The color of the cell ranges from deep orange to pure green; the largest cells were green, but cells of this color were found of all sizes down to the smallest. The only distinction other than color was that the largest green cells had a thinner wall than the small or moderate sized cells, either green or orange, and that the colored cells seemed more active in spore formation. The wall of the spore was fully developed while the wall of the mother cell was still perfect; after the disappearance of the latter the spores remained in a spherical gelatinous mass for a long time, until they had increased very materially in size; colonies of 32 cells were observed, retaining the spherical form with a diameter of 100  $\mu$ . Some of the plant was kept alive for several weeks, but not under the normal conditions of a salt marsh pool; in this material were finally found numerous spherical colonies, in which the contents of each cell had divided into aplanospores of a second generation, much smaller than any noticed in the normal condition of the plant. From *P. miniatus*, *P. marinus* is distinguished by the larger cells, those of *P. miniatus* being 3–15  $\mu$  diam.; by the thicker walls of the aplanospores, and by the totally different habitat. According to the figures of *P. miniatus* in Chodat's *Algues Vertes de la Suisse*, fig. 80, the gelatinous vesicle of the spores is less regular in form in that species and less persistent.

**Chaetomorpha Chelonum** n. sp. Filamento erecto, stricto, 12–20  $\mu$  diam. ad basin, superne incrassato, usque ad 35  $\mu$  in fronde sterili; cellula basali ad 1 mm. longa, cellula proxima ad 10 diam., cellulis superioribus 2–3 diam. longis; membrana cellulari crassa; cellulis fertilibus in parte superiori filamentis ortis, ad 50  $\mu$  diam., 1–4 diam. longis, leviter aut admodum moniliformibus aut enim subglobosis; zoosporis per aperturam in media parte cellulae et tubum tenuissimum exeuntibus; ramis pluricellularibus, coralloideis, e cellula basali exeuntibus, stratum basale continuum substrato arctissime adhaerentem formantibus.

Filaments erect, straight, 12–20  $\mu$  diam. at base, increasing in size upwards, to 35  $\mu$  in the upper part of the vegetative plant; lower cell up to 1 mm. long, next cell up to 10 diam. long, upper cells 2–3 diam.; walls thick; fertile cells in upper part of the filament, up to 50  $\mu$  diam., 1–4 diam. long, from slightly moniliform to nearly globular; zoospores escaping by an opening near the middle of the cell, through a very short tube; basal layer a dense mass of very irregular, pluricellular, coralloid branches, forming a dense and continuous expansion on the substratum. On the backs of the turtles, *Chrysemys marginata* and *Aromochelys odorata*, Walnut Lake, Oakland County, Michigan, Dr. T. L. Hankinson.

Species of *Chaetomorpha* are abundant in all seas, but very unusual in fresh water, the only species which can be considered as well known being *C. Herbipolenis* Lagerh.,<sup>1</sup> which was found in a hothouse in a botanical garden, the place of its origin being unknown. *C. Henningsii* Richter<sup>2</sup> occurring in fresh water near Berlin, is uncomfortably near the marine *C. aerea*, which is said to be found occasionally in fresh water. The present species seems to be amply distinct from *C. Herbipolenis*, by the smaller diameter, longer basal cell, and especially by the strongly developed basal layer, that of *C. Herbipolenis* being merely an outgrowth from the membrane, while in the present species there are distinctly branching, pluricellular filaments, which unite to form a practically continuous layer on the substratum, the shell of the turtle. The basal developments of the individual plants are so closely united that the appearance is that of a continuous membrane, from which arise numerous erect, bright green, straight filaments, pretty uniformly increasing in size from the base to the apex. The cell wall is thick, in the lower cell about one quarter the diameter; the cells in the vegetative filaments are nearly cylindrical, but the fertile cells are strongly swollen, sometimes nearly globular. The material examined having been preserved in formalin, nothing can be said as to the finer details of the zoospores, but evidently large numbers are formed in a cell. Emptied cells showed plainly an aperture near the middle, the cell wall extending as a very short tube, much like that shown for *C. Herbipolenis*, Pl. IX, fig. 5. Two lots of material were received from Dr. Hankinson, one having grown on *Chrysemys*, the other on *Aromachys*; there was some difference between the two, the former having basal cells longer and more slender than the latter, and fertile cells more distinctly swollen.

<sup>1</sup> G. Lagerheim, Ueber die Süsswasser-Arten der Gattung Chaetomorpha Kütz. Ber. Deutsch. Bot. Ges., Vol. V, p. 185, 1887.

<sup>2</sup> P. Richter, Hedwigia, Vol. p. 70, 1893.

Lagerheim, l. c., p. 201, suggests that fresh water *Chaetomorpha* species should be expected in the United States, especially in Massachusetts, as the algal flora here has an almost tropical character. This characterization, which hardly seems to harmonize with the weather of the past winter and spring, was based on his inspection of desmids from Tewksbury. The occurrence of a fresh water *Chaetomorpha*, even farther north than Tewksbury, is of interest.

**Cladophora (Aegagropila) amphibia** n. sp. Filamentis inferioribus contortis; cellulis forma et magnitudine inaequalibus, subcylindricis, 2–5 diam. longis, 40–70  $\mu$  diam., aut 1–2 diam. longis, ad 100  $\mu$  diam. in parte media incrassatis; filamentis abunde et irregulariter ramosis, ramis similibus, filamentis ramos erectos etiam gerentibus, 30–50  $\mu$  diam., cellulis 4–8 diam. longis, subcylindricis at plus minusve irregularibus, paucos ramulos breves patentis emittentibus; cellula terminali obtusa vel truncata; rhizoidis incoloribus interdum a cellulis inferioribus ortis.

Lower filaments contorted, cells of irregular form and size, subcylindrical, 2–5 diam. long, 40–70  $\mu$  diam., or 1–2 diam. long, swollen to 100  $\mu$  diam. in the middle, freely and irregularly branched, branches of similar character; also bearing erect branches, 30–50  $\mu$  diam., cells 4–8 diam. long, subcylindrical but somewhat irregular, bearing a few mostly short and patent branches; terminal cells obtuse or truncate; slender colorless rhizoids occasionally produced from the lower cells. On damp ground, among *Salicornia*, in a salt marsh, Alameda, California, Sept. 26, 1903, *W. J. V. Osterhout & N. L. Gardner*. Distributed as P. B.–A., No. 1284.

This plant forms a thin extended layer on ground covered only at the highest tides, and has the habit of a *Vaucheria*. The lower part is densely matted, the upper surface is formed by the free ends of the erect branches. These erect branches are fairly regular in form, varying from a true cylindrical shape about as do the filaments of a *Rhizoclonium*; the basal filaments, however, are very irregular, the cells varying from long and cylindrical to short and ovoid, or of a triangular section, the latter apparently where a branch is starting from a short cell; cells of larger and smaller diameters may alternate, or there may be a series of swollen cells, giving a moniliform appearance. Some of the filaments end in a large, ovoid cell, others taper to a slender, tortuous rhizoid. In many cases the first cross wall in a branch is quite a distance from the base, reminding one of *Siphonocladus*. The cell wall is quite thick; the color is a dull green. Although observed by Dr. Gardner for a long time, no indication of spores was seen.

**Vaucheria longipes** n. sp. Filamentis 80–90  $\mu$  diam., sparse et irregulariter ramosis; ramo sporifero, 30–40  $\mu$  diam., sub angulo recto exeunte, 1–6 mm. longo, antheridium terminale, cylindricum aut paulo attenuatum, hamatum vel circinatum sustinente; oogoniis 2–4, ovoideis, subobliquis, pedicellatis, 70–85  $\times$  35–40  $\mu$ , antheridium superantibus; rostro 15  $\mu$  longo; pedicellis 100–150  $\mu$  longis, 20–30  $\mu$  diam., sub antheridio ortis.

Filaments 80–90  $\mu$  diam., oogonia and antheridia borne at the end of a branch 1–6 mm. long, 30–40  $\mu$  diam.; antheridium terminal, cylindrical or slightly tapering, hooked or circinate; oogonia 2–4, ovoid, somewhat oblique, pedicelled, 70–85  $\times$  35–40  $\mu$ , usually surpassing the antheridium; pedicels 100–150  $\mu$  long, 20–30  $\mu$  diam., arising just below the antheridium; beak 15  $\mu$  long. In a ditch by the roadside, Ross Valley, California, Jan., 1904. *N. L. Gardner.*

Somewhat resembling *V. geminata*, but distinct by the very long fruiting branches, at right angles to the filaments, as well as by the more elongate oogonia, borne on longer pedicels.

**V. Gardneri** n. sp. Filamentis 50–70  $\mu$  diam., sparse ramosis, ramis sub angulo recto exeuntibus, non attenuatis; chromatophoris parvis; antheridiis plerumque solitariis, raro 2–4, et oogoniis 2–4, raro pluribus, pedicellatis, pedicellis basi connatis, 60–100  $\mu$  longis, 15–20  $\mu$  diam.; antheridii pedicello angulo recto vel subrecto posito; pedicellis oogoniorum circumcirca positis, sub angulo 45° exeuntibus; antheridio hamato vel circinato, ad 10  $\mu$  diam. attenuato; oogoniis plerumque sat obliquis, saepe introrsum concavis, 85–95  $\times$  70–75  $\mu$ ; plerumque antheridium superantibus; rostro circa 15  $\mu$  longo.

Filaments 50–70  $\mu$  diam., sparingly branched, branches issuing at a right angle, not tapering; chromatophores small; antheridia generally single, rarely 2–4; oogonia 2–4, rarely more; both pedicelled, pedicels connate at the base, 60–100  $\mu$  long, 15–20  $\mu$  diam.; pedicel of the antheridium at a right angle or nearly so; pedicels of the oogonia arranged around it at an angle of about 45°; antheridium hooked or circinate, tapering to 10  $\mu$  diam.; oogonia usually quite oblique, often concave on the inside, 85–95  $\times$  70–75  $\mu$ ; generally surpassing the antheridium; beak about 15  $\mu$  long. In a small pool, Mountain View Cemetery, Oakland, California, May 6, 1903; in a ditch by the roadside, Berkeley, California, April 15, 1905. *N. L. Gardner.* Distributed as P. B.–A., No. 1288.

Forma **tenuis** n. forma. Filamentis 30–40  $\mu$  diam.; oogoniis et antheridiis ut apud formam typicam, sed numeris variantibus; antheridiis haud infrequenter 2, oogoniis 1–5.

Filaments 30–40  $\mu$  diam., oogonia and antheridia as in the type, but in varying numbers; antheridia not infrequently 2, oogonia 1–5. In company with *V. longipes*.

This species is not unlike *V. longipes*, but the pedicels bearing the

organs of fructification are placed directly on the filament, radiating from one spot; the oogonia are much more oblique, often concave inside. When there are two oogonia and one antheridium, there is a certain resemblance to *V. geminata*; but the slender radiate pedicels make it amply distinct; the forms with many oogonia and antheridia are quite unlike anything else. The largest number of pedicels observed in one group is twelve; four bearing antheridia, eight oogonia.

MALDEN, MASSACHUSETTS.

#### EXPLANATION OF PLATE 76.

Fig. 1, *Vaucheria longipes*.

Fig. 2, *V. Gardneri*, group of four oogonia and one antheridium.

Fig. 3, " " group of two " " " "

#### THREE PLANTS FROM MAINE.

ORA W. KNIGHT.

DURING the fall of 1906 while collecting along the shore near Otter Cliffs, Mount Desert Island, I found a very peculiar form of *Juniperus horizontalis* Moench, with lobed fruit, growing in an extensive patch by itself, while elsewhere the typical plant prevailed. As this plant seems worthy of a name I propose to call it:—

*JUNIPERUS HORIZONTALIS* Moench, forma **lobata**, forma nov.

Characters:—differs from *J. horizontalis* in having more elongate fruit which is strongly two-, three- or even four-lobed at the apex. The fruit when mature is pale green in color, slightly tinged with bluish, or occasionally pale greenish blue. Type locality: rocky cliffs along shore, Otter Cliffs, Mount Desert Island, Maine. Type No. 5311 O. W. K., October 3, 1906.

For two seasons I have had under observation a very peculiar hybrid *Pyrus* whose exact affinities were open to some slight doubt at first, but as the question now seems satisfactorily settled I propose to call it:—

***Pyrus Americana* × *arbutifolia*, comb. nov.<sup>1</sup>**

<sup>1</sup>[Hybrids ascribed to the same parentage have been observed in cultivation. See, for example, Schneider, Ill. Handb. d. Lanbholzk. i. 677.—Ed.]